

## **REMARKS**

Claims 1, 4, and 13-16 have been amended.

Claims 1-16 are pending in the application.

Basis for the amendment to add new parts (b)(vi) and (b)(vii) to Claim 1 is found, for example, in Claims 5, 6, 10, and 11 as originally filed; and in Pars. 0034 and 0035 of the specification. See also Pars. 0111 and 0115 of the specification.

In addition, the terms “polymer substrate” and “polymer surface” have been added in several locations in Claims 1, 4, 13-16. These changes are intended as clarifications only. The term “surface” previously appeared in other portions of Claim 1 as originally filed; while basis for “polymer substrate” (if basis is needed) may be found, for example, in Pars. 0035 and 0116 of the specification. Other, minor clarifications have also been made, none of which are intended to change the scope of the Claims.

### **The Prior Art Rejections**

Each of Claims 1-2, 4-14, and 16 was rejected on one or more prior art grounds. Claim 1 is the sole pending independent Claim. If independent Claim 1 is novel and nonobvious, then it logically follows that each of its dependent Claims must necessarily be novel and nonobvious as well. See M.P.E.P. § 2143.03, first paragraph. In the interest of simplicity the following discussions of the three cited references will therefore focus on independent Claim 1. Applicants reserve the right to present alternative arguments at a later date.

### **The § 102(e) Rejection Over Brandow**

Claims 1, 2, 4-11, 13, and 14 were rejected as being anticipated by Brandow under 35 U.S.C. § 102(e). For the record, Applicants do not concede that Brandow is necessarily available as a reference under § 102(e). For the time being, however, Applicants will demonstrate that Brandow would not anticipate amended Claim 1 even if one assumed, for the sake of argument, that Brandow were available as a reference under § 102(e).

Amended Claim 1 includes the limitation:

*(vii) provided that*, if the reactant is an amine, then said process additionally comprises the step of reacting the amine with carboxyl bound to the polymer to produce an amide group that covalently links the reactant to the polymer.

By contrast, Brandow teaches the reaction of a primary or secondary amine to form an imine, followed by reduction to an amine. Brandow never suggests the formation of an amide:

An aspect of the present invention is a process for modifying a substrate in areas that are exposed to actinic radiation, having the steps: . . . (c) contacting the photoproducts with a primary or secondary amine in the presence of hydrogen ions, forming imine groups; and (d) contacting the imine groups with a reducing agent, forming amine groups on the substrate in the exposed region.

Brandow, col. 1, line 66 through col. 2, line 11. See also Brandow's Abstract and Brandow's Claim 1.

Thus Brandow does not anticipate the claimed inventions.

### **The § 102(b) Rejection Over Gudimenko**

Claims 1, 2, 4, 11, 14, and 16 were rejected as being anticipated by Gudimenko under 35 U.S.C. § 102(b).

Amended Claim 1 includes the limitation:

*(vi)* the one or more reactants are selected from the group consisting of amines, imides, azides, azo compounds, cyanates, alcohols, thiols, anhydrides, thionyl halides, metal oxides, ceramics, piezoelectric materials, semiconductors, oligonucleotides, antibodies, antigen-binding portions of antibodies, antigens, enzymes, non-enzymatic peptides, non-enzymatic proteins, polymers, reduced metals, and oxidized metals . . . .

Gudimenko teaches reaction with none of these reactants. Instead, Gudimenko teaches silylation of the surface. See the entire document including, e.g., the Abstract; col. 5, lines 23-54; col. 15, line 5 through col. 17, line 14, and Gudimenko's Claim 1.

A computer-assisted word search of Gudimenko's text will reveal some of the same terms that are found in the list of reactants of amended Claim 1, particularly "amine" and "imide." However, reviewing the context in which these terms are used by Gudimenko shows clear differences in each case. For example, Gudimenko teaches that the polymeric substrate may be a "polyimide" (col. 9, lines 42-50; Gudimenko's claim 8), but not that the reactant that reacts with the polymeric substrate can itself be an imide.

As another example, Gudimenko's silating agents may contain amine groups (col. 15, line 12 through col. 16, line 29). However, in Gudimenko the amine moieties act as leaving groups when the silicon atoms bond with the surface of the substrate (col. 15, lines 22-25; col. 15, line 66 through col. 16, line 2). Gudimenko does not teach the binding of amine groups to the polymeric substrate. Thus, even if one were to construe Gudimenko's aminosilane reagents as being "amines" otherwise within the scope of part (b)(vi) of amended Claim 1, it would still be the case that nothing in Gudimenko would teach the limitation of part (b)(vii) of amended Claim 1:

*(vii) provided that, if the reactant is an amine, then said process additionally comprises the step of reacting the amine with carboxyl bound to the polymer to produce an amide group that covalently links the reactant to the polymer.*

Gudimenko's aminosilanes result in the bonding of silyl groups to the polymer substrate, not in amide groups.

Thus Gudimenko does not anticipate the claimed inventions.

### **The § 103(a) Rejection Over Bilyk**

Claims 1, 2, 4-11, 13, and 14 were rejected as being obvious over Bilyk under 35 U.S.C. § 103(a). For the record, Applicants do not concede that Bilyk is necessarily available as a reference under § 103(a). For the time being, however, Applicants will demonstrate that Bilyk would not have suggested the invention of amended Claim 1 even

if one assumed, for the sake of argument, that Bilyk were available as a reference under § 103(a).

Bilyk sets forth a “laundry list” of various methods for modifying surfaces, including:

- chemical oxidation with oxidizing agents
- surface chemical grafting
- corona discharge
- flame treatment
- plasma treatment
- UV irradiation
- sulfonation with sulfur trioxide gas
- halogenation
- atmospheric plasma
- non-depositing plasma treatment
- excimer laser treatment in the presence of an oxidizing atmosphere.

Bilyk, Col. 2, lines 18-23; col. 6, lines 8-22.

However, nothing in Bilyk would have motivated a person of ordinary skill to specifically select UV irradiation from this lengthy list of other surface-modification techniques. To the contrary, Bilyk teaches that the preferred method instead uses “an electrical discharge for instance corona discharge or atmospheric plasma, flame treatment, chromic acid treatment, halogenation or combination thereof . . . .” (Col. 6, lines 23-26). For this reason alone, the claimed inventions are nonobvious over Bilyk.

Furthermore, nothing in Bilyk teaches or suggests the limitation of part (b)(vii) of amended Claim 1:

*(vii) provided that*, if the reactant is an amine, then said process additionally comprises the step of reacting the amine with carboxyl bound to the polymer to produce an amide group that covalently links the reactant to the polymer.

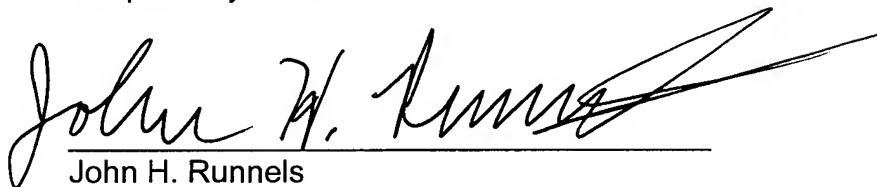
Although Bilyk employed polyamines, Bilyk nowhere suggested “reacting the amine with carboxyl bound to the polymer to produce an amide group that covalently links the reactant to the polymer,” as in amended Claim 1 of the present patent application.

Bilyk neither teaches nor suggests the claimed inventions.

### **Conclusion**

It is respectfully submitted that all grounds of rejection have been overcome, or should otherwise be withdrawn. Allowance of Claims 1-16 at an early date is respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "John H. Runnels", is written over a horizontal line.

John H. Runnels  
Registration No. 33,451  
Taylor, Porter, Brooks & Phillips, L.L.P.  
P.O. Box 2471  
Baton Rouge, Louisiana 70821  
(225) 387-3221

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